

On the Morphology and Systematic Position of the Epicarides of the Family Dajidæ. By MM. A. GIARD and JULES BONNIER.

In a previous paper (see 'Annals,' ser. 6, vol. iii. p. 512), for reasons derived from the ethology of the animals, we have regarded the Dajidæ as a group intermediate between the Cryptoniscians and the Bopyrians proper, with which they would be connected by the family of the Phryxians. This view is now confirmed by the anatomical investigations which we have been enabled to make of some types of this group, which is still so little known and so badly represented in collections.

The Rev. A. M. Norman has been kind enough to send us a specimen of *Dajus mysidis*, Kröy., collected at the island of Jan Mayen upon a *Mysis oculata*, Fabr., during the Austro-Hungarian expedition to the arctic seas*. He has also submitted to our examination an *Aspidophryxus* parasitic upon *Erythrops microphthalmus*, G. O. Sars, and dredged by G. O. Sars himself upon the Norwegian coast.

The unique specimen of *Dajus mysidis* figured but not described by Kröyer was a young female, accompanied by a male in the Cryptoniscian stage. The six females collected at Spitzbergen during the Dutch 'Willem Barents' expedition and studied by Hoek were also immature, and only one of them bore a male in the second larval form. Buchholz alone has described the adult male and female of *Dajus mysidis*, Kröy., under the name of *Leptophryxus mysidis*†. But his description is very incomplete, especially with respect to the inner antennæ and the incubatory plates.

Of the latter there are five pairs as in all Bopyrians, and the fifth pair, which escaped the notice of Gerstäcker, is the most developed. This forms the greater part of the incubatory cavity. The body, bent ventrally on each side, also takes part in the formation of this cavity. The morphology of the head and thorax differs little from that of the same parts in the Phryxians. However, the feet of the sixth and seventh thoracic segments are entirely wanting, thus reproducing an embryonic arrangement which is transitory in the other Bopyrians. Further, the first five pairs of feet are very closely approximated to the anterior part of the animal, where they surround the aperture of the incubatory chamber. The metamerization is very visible upon the middle of the dorsal part in both the abdominal and the thoracic regions; in the latter the segments increase in size from before backward. On the pleon the first pair of feet alone are well developed in the form of biramose lamellæ, which, in this part, close the incubatory chamber. The other pleopoda are rudimentary, with no pleural laminæ; there are two uropoda.

* We keep the name of *Dajus mysidis*, Kröy., for the parasite of *Mysis oculata*, and give that of *Dajus mixtus* to the *Dajus* found by G. O. Sars at Vadsøe upon *Mysis mixta*, Lillj.

† 'Zweite deutsche Nordpolarfahrt in den Jahren 1869 und 1870,' Bd. ii. Abth. i. p. 287, Taf. ii. fig. 2 (Leipzig, 1874).

The adult male presents the pleon characteristic of the male of *Phryxus*, without pleopoda or uropoda. But the antennæ and the rostrum strongly remind us of the structure of the Cryptoniscian embryos.

The examination of *Dajus* renders that of *Aspidophryxus* much easier. The *Aspidophryxus* which has been entrusted to us by Mr. Norman had been determined as *A. peltatus* by G. O. Sars. But the type of *Aspidophryxus peltatus* described and figured by Sars is parasitic upon *Erythropus Goesi*, and what we know of the vigorous specificity of the Epicarides to each definite host led us at once to regard the parasite of *Erythropus microphthalmus* as belonging to a distinct species. A minute comparison of this parasite with the figures given by G. O. Sars, which are so exact, appears to us to justify this supposition, and we shall give the name of *Aspidophryxus Sarsii* to the Epicaride of *Erythropus microphthalmus*.

This new species differs from *Aspidophryxus peltatus* (1) in the less widened and more slender general form of the female, (2) in the number and arrangement of the ova in the incubatory chamber.

While in *A. peltatus* the ova are diffused in great numbers and without order in the incubatory cavity, in *A. Sarsii* they are 134 in number, arranged in regular concentric rows, each row containing respectively 17, 17, 15, 10, 5, and 3 ova in one half of the body, between the free margin and the median line. These ova are moreover larger than those of *A. peltatus*. Further, the animal is less distinctly segmented. In the male, on the contrary, the segments of the pleon, although soldered together, are more distinct than in *A. peltatus*.

If we referred exclusively to the description and figures given by G. O. Sars, there would be much more considerable differences between the two species, and the genus *Aspidophryxus* would seem far removed from the genus *Dajus*. The complete absence of incubatory lamellæ in the female (*laminae incubatoriae nullae*) and the existence of only six pairs of thoracic feet in the male would constitute characters of great importance in this group of Epicarides. But we have ascertained that these characters were due to errors of observation. The incubatory lamellæ all exist as in *Dajus*; the first four pairs are more reduced, in consequence of the approximation of the thoracic feet to the anterior part of the body. Like the first pair in the other Bopyrians, they have only an accessory function in the protection of the ova. As to the fifth lamellæ, these are represented by a pair of narrow plates bordering the free edges of the greatly enlarged last thoracic somites; they terminate in digitations posteriorly. These plates are applied to each other exactly in the median line, and with the lateral ventral folds of the thoracic somites form the incubatory cavity properly so called.

The pleon also presents considerable reductions compared with that of *Dajus*. It is completely destitute of appendages and forms a small cavity, in which is lodged the male, folded up like a Scarabæan larva and placed in profile.

This male differs little from that of *Dajus*; the segments of

the pleon are more distinctly indicated and there is a well-developed pair of uropoda. As to the thoracic feet, they are of the normal number of *seven* pairs, of which the first and smallest belong to a narrow segment soldered to the head, which has escaped the notice of G. O. Sars. The prominent rostrum and the very long outer antennæ very closely resemble in form the same organs in the Cryptoniscians. The passage from the Dajidæ to the Cryptoniscians may be understood in the following manner:—In the male the development has been arrested in the Cryptoniscians at the second larval form, whilst in the Dajidæ there has been a transformation into a degraded male. In the female the anterior part of the incubatory chamber has been considerably contracted in the Cryptoniscians, whilst a cavity was formed at the expense of the lateral folds and of the posterior part of the body; but this cavity cannot be in any way confounded, as suggested by Fraisse, with the coelomatic cavity. The profound modifications of the incubatory cavity of the Dajidæ and Cryptoniscians will be examined in detail in a memoir with plates. It may be observed, in conclusion, that the *Erythrops microphthalmus* parasitized by *A. Sarsi* was a female destitute of ova, no doubt owing to parasitic castration.—*Comptes Rendus*, May 13, 1889, p. 1020.

A Parasitic Copepod. By Prof. LEIDY.

The author stated that last summer while at Beach Haven, N. J., there was brought to him from the surf a living specimen of the singular transparent fish *Leptocephalus*. In examining it he observed attached to the tail-fin a minute Copepod Crustacean, apparently of the genus *Chalimus*. The parasite was attached by a long filiform rostrum, and resembled in this and other respects more the *Chalimus Scombri* as represented by Baird in fig. 5, tab. xxxiii. of the 'British Entomostraca,' than it does the original of this species as represented by Burmeister in the *Nova Acta Nat. Cur. of Bonn*, xvii. tab. xxiii. fig. 13. The species, which may be distinguished as *Chalimus tenuis*, is considerably less than half the size of *C. Scombri*. The cephalothorax, nearly twice as long as broad, is obcordate and proportionately much narrower than in the latter species. The frontal segment is narrow and not prominent laterally, and the biarticulate antennæ are concealed beneath. The abdomen, half the length of the cephalothorax, exhibits three conspicuous divisions, and the short caudal appendages end in three minute setæ. Abdominal feet ending in biramose leaf-like segments fringed with short setæ. Rostrum linear and almost as long as the cephalothorax. Whole length 1.125 millim.; length of cephalothorax 0.5, breadth 0.275; length of rostrum 10.5; length of abdomen 0.25.—*Proc. Acad. Nat. Sci. Philad.* April 16, 1889, p. 95.